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Big Sky CLEARWATER

OFFICIAL
BULLETIN

VOLUME VI

No. 2

June, 1976



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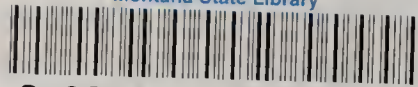
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FIFTH
ENVIRONMENTAL
ENGINEERS
CONFERENCE

JUNE 16-17-18

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FIFTH ENVIRONMENTAL ENGINEERS CONFERENCE
SLATED FOR JUNE 16-18, 1976

The Fifth Environmental Engineers Conference sponsored jointly by Montana State University and the Department of Health and Environmental Sciences will be held June 16 through 18 at Big Sky of Montana. The conference series is designed to acquaint Montana's consulting engineers, city engineers, managers and decision-makers with timely and important topics. Previous conferences have stressed new laws, rules and regulations, recent advances in waste treatment, and land disposal of sewage effluents. The fourth of the series was attended by 80 engineers and managers and resulted in a book edited by R. L. Sanks and Takashi Asano entitled LAND TREATMENT AND DISPOSAL OF MUNICIPAL AND INDUSTRIAL WASTEWATER (310 pp.) published by Ann Arbor Science Publishers, Inc. in January, 1976. The forthcoming conference will also form the basis for a text, which will probably be published within 18 months.

Water treatment plant design is the subject for the forthcoming conference in June. Public Law 93-523, the "Clean Water Act", will require upgrading the treatment of virtually all of Montana's surface water supplies, and the conference is intended to provide the latest, best, and most practicable information on upgrading existing plants or designing new ones. It is specifically programmed for the design engineers and decision-makers of Montana and other northern Rocky Mountain states.

The conference will be held at Big Sky of Montana, partly because of its fine facilities and partly because of the opportunities for family activities for those wishing to bring their wives and children. The family activities include: a sight-seeing trip through Yellowstone Park; an early morning bird and nature walk, with breakfast in the field; and an all-day hike to Petrified Forest. Other activities include hiking, riding, tennis, golf, swimming, and photography.

The technical program is crammed with useful information to be given by the most outstanding engineers and experts in the

country. All of these experts will remain at the conference for the full three days so that they can be available to answer questions and provide helpful advice. Bring them your problems.

Reservations and Deadlines

The facilities limit the number of participants to 110 who will be selected on a first come-first served basis. Mailings have been sent to local members of the AWWA, MWPCA and ASCE. However, if you did not receive one and wish to attend, telephone Big Sky immediately for reservations (toll free within Montana, 800/332-4491 or toll free from out-of-state, 800/548/4486) and if there is space, then telephone Bob Sanks (994-2111) for instructions.

The registration fee for the conference is \$150. It is a modest fee compared with the national average and is needed for fees and travel expenses for the speakers. The cost of accommodations and meals at Big Sky are comparable with the cost of good hotels anywhere and the luxury of the accommodations is unmatched.

Program

The program will be presented by probably the finest complement of experts in the field of water treatment and water supply that has ever been gathered into a single conference.

The program will start with D. G. Willems and A. W. Clarkson of the State Department of Health and Environmental Sciences discussing the effect of regulations on design, followed by Dr. A. W. Hoadley of Georgia Institute of Technology on Public Health and Water Supplies.

A section on monitoring of water supplies including instrumentation, chemistry and automatic control will be presented by Gerry Shell of Gerry Shell Environmental Engineers, Brentwood, Tennessee; Dr. John Sickafoose of Hach Chemical Company; Dr. Rhodes Trussell of Montgomery Engineers, Pasadena, California and Mr. Wellman E. Nusbaum of Black and Veatch, Kansas City.

Process design section of the program will cover design of coagulation, sedimentation, granular filtration, diatomaceous earth filtration, suspended solids removal, $KMnO_4$, reverse osmosis, ion exchange, softening, cathodic protection, activated carbon, chlorination, and sludge disposal. Participating in the process design seminar will be Dr. Charles O'Melia of the university of North Carolina; Donald Walker of Aurora, Illinois; Dr. E. Robert Bauman of Iowa State University; Dr. Robert T. O'Connell of the Permutit Co., W. R. Conley and S. P. Hansen of Neptune-Microfloc; Tom Binford of Dorr-Oliver, K. J. Ficek of Carus Chemical; I. Nusbaum of San Diego; Dr. R. L. Sanks of Montana State University; Douglas T. Merrill of Brown & Caldwell, Seattle, Washington; Robert Eisgrau of Wallace & Tiernan, San Francisco; Billy Kornegay of Westvaco, Covington, Virginia; Lloyd Clark, Gilbert Groff and Wayne Taylor of Clark & Groff Engineers, Salem, Oregon; and Dr. Arley DuBose, Superintendent of Wastewater Treatment at Gainesville, Florida.

Equipment selection, package plants and pump stations will be discussed by Conley and Hansen of Microfloc; O'Connell of Permutit and Jim Wright of Black and Veatch. Mr. Terry M. Regan, T. M. Regan, Inc. of Lexington, Kentucky, will report on O & M manuals and operator training.

Each section of the conference will be finished with a lively round-table discussion by the participants. It promises to be a highly instructive conference.

* * * * *

SIXTEEN YEARS AGO
by Ken Johnston

While cleaning out old papers and junk, I came across an article in a national women's magazine dated 1960 that caused me to stop and reflect upon the progress that has been made in water resource protection since the article was written in 1960.

The author pointed out the dangers of rapidly increasing pollution of the nation's waters in a very graphic manner. "We think that the water we draw from our tap is pure," he says, "but don't take it for granted!"

The city of Rensselaer, New York, was telling customers that "...city water in Rensselaer is so polluted that it is dangerous for human consumption." The bacterial count in their water had soared. In Salt Lake City, cases of hepatitis had increased to three times the previous year's level, and water supplies were suspect. A Denver suburb was complaining that their water was milky and smelled like a swamp because six other communities were dumping raw sewage into the creek that supplied them. In Colorado and New Mexico radioactivity of water supplies ranged from 40% to 160% above maximum permissible levels from uranium milling wastes discharged into the Animas River.

In case after case, the results of increasing population and industrial activity were shown to be causing water supply pollution problems. A spectacular sudsy water in Chanute, Kansas was due to the buildup of "hard" detergents, and a glass of Chanute water had a head on it like a mug of Budweiser! Detergent problems were widespread across the nation.

Sixteen years ago, people were worried about the effect of pesticides. DDT, DLD, chlordane, aldane, and other powerful pesticides were uncontrolled and the usage had quadrupled in only four years. "What is the cumulative impact of these chemicals, singly or in combination, on the human beings that drink them?" was being asked by the Public Health Service.

Many communities were still dumping enormous tonnages of disease-carrying sewage, raw and untreated, into the water sources of their downstream neighbors. As I recall, 16 years ago Great Falls was just completing their primary plant to take their raw sewage out of the Missouri.

CORROSION OF CONCRETE SEWER PIPE

by R. L. Sanks

Kansas City was dumping raw sewage into the Missouri which was a major concern of officials in St. Louis, but St. Louis was dumping raw sewage and ground garbage into the Mississippi causing problems to cities below them.

Packing plants at Sioux City were dumping wastes into the Missouri River which caused gassing sludge banks, and offensive odors drifted from the river.

Sounds horrible? It sure does, and it makes one think about what would have happened if the great clean-up effort, of which we are all a part, had not taken place. What would the waters of this nation look and smell like if the massive pollution control programs, such as the National Pollutant Discharge Elimination System, had not been put into operation?

Sometimes we cuss the system, sometimes it may seem like "Big Brother" is looking over our shoulder and dictating to us, but when one reflects back into the conditions that were developing a few years ago, the cure doesn't seem all that bad. Water quality is improving. Industrial wastes are nearly under control, sewage has been primary treated for some time now, and secondary treatment for all domestic waste is nearing that goal.

Sixteen years ago, under Public Law 660, a city could get federal assistance to construct sewage facilities up to 30 percent, or a maximum of \$250,000.

As the women's cigarette advertisement says, "You've come a long way, baby!"

And that's the way it was, sixteen years ago.

Diplomacy is telling your boss he has an open mind when you really mean he has a hole in his head.

At least two cities in Montana have experienced corrosion of concrete sewer pipe. Sewer pipe is expensive to install and even more expensive to replace. Since corrosion can be easily prevented (or at least inhibited) by proper maintenance, it is inexcusable to allow corrosion to occur. Concrete pipe in appropriate circumstances and with appropriate maintenance will last indefinitely. However, if the sewage is allowed to become septic and if hydrogen sulfide gas is allowed to develop unchecked, certain bacteria can convert the hydrogen sulfide (a weak acid) into sulfuric acid (one of the strongest acids). It is the sulfuric acid which corrodes concrete.

A mechanism for corrosion is shown in the figure. If slime and silt are allowed to accumulate in the pipe, protolytic bacteria, such as Spirovibrio desulfuricans, convert sulfate and organic sulfides to hydrogen sulfide which is only sparingly soluble in water. The hydrogen sulfide escapes from the surface of the sewage and becomes available to sulfur oxidizing bacteria attached to the walls of the pipe above the water surface. Thiobacillus concretivorus oxidizes the hydrogen sulfide to sulfuric acid which attacks the lime content of the cement. Corrosion is most pronounced just above the normal water surface and at the crown of the pipe.

There are three necessities for these reactions to occur: (a) there must be an anaerobic place for hydrogen sulfide to form, (b) there must be a damp atmosphere above the water surface, and (c) nutrients must be available. Sewer pipes carrying municipal wastes and flowing partly full have both damp atmospheres and plenty of nutrients. Deposits of slime and silt are ideal breeding grounds for the bacteria which form hydrogen sulfide.

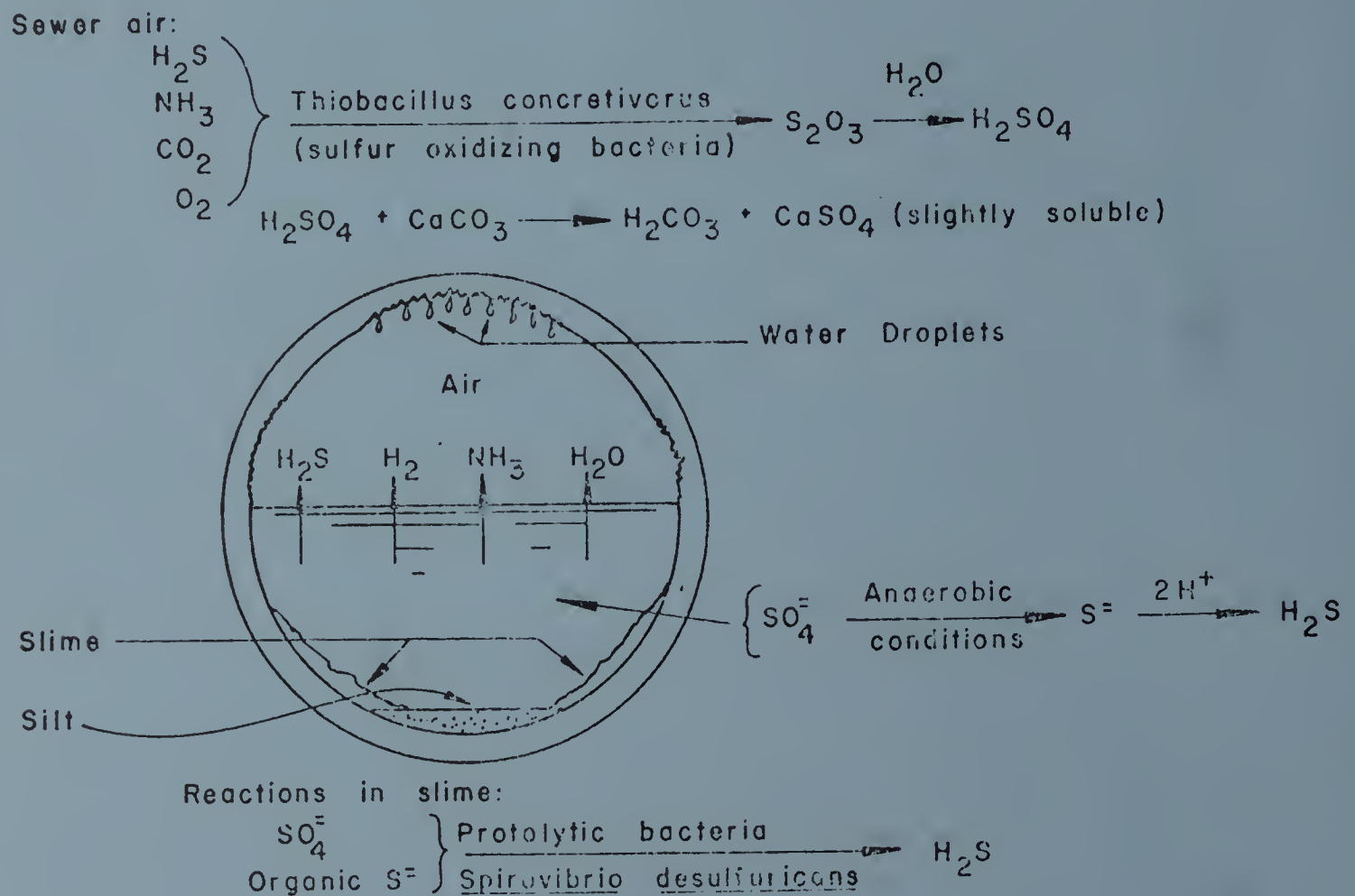
There are many ways to break up this chain-reaction of events which result in

corrosion, but most of them are impractical, expensive, or impossible to utilize once the sewer pipe has been laid. But there is one practical method which can be used for existing sewers: flushing the sewer periodically. All that is needed is a gate in a downstream manhole which can be closed for a few hours once a week to allow the sewage to back up and fill the sewer pipe. When the gate is opened quickly, the resulting high velocity washes the sulfur oxidizing bacteria off the walls and scours out the slime and silt which are breeding places for the protolytic bacteria.

Periodic inspection of sewer lines by closed circuit TV cameras is invaluable

for detecting corrosion before it gains too great a foothold. If corrosion is known or suspected, a preventative program of flushing the line can be instituted. Corrosion of concrete pipe is enhanced by the following circumstances: high sulfate content in the water supply, inverted siphons, low velocities, long pipelines, and septic sewage (often indicated by black or dark grey color).

The preventative maintenance described is neither time-consuming nor costly, but it does require responsible workers who will not forget that they have closed a gate valve at a manhole!



CORROSION OF CONCRETE PIPE

FUNDS RAISED FOR COBLEIGH MEMORIAL

A memorial scholarship fund dedicated to the late Dean Cobleigh, an early leader in the environmental field of water and wastewater in the state of Montana, is supported by the Montana Section of the AWWA and by the Montana Water Pollution Control Association. At the Butte convention an assessment on each registration and a special fund raising raffle for bottles of champagne were successful in adding \$400 to the fund.

Treasurer
Montana State University
Bozeman, Montana 59715

Dear Sir:

Please accept the enclosed check in the amount of four hundred dollars (\$400) for the Cobleigh Memorial Scholarship Fund.

This donation is from the last Joint Conference of MWPCA/MSAWWA held in Butte in March with a total of one hundred twenty (120) men registrants @ \$1.50 each for a total of one hundred eighty dollars (\$180), plus a fund-raising drive that amounts to two hundred twenty dollars (\$220).

Sincerely,

Miles E. Tuttle
Chairman-MSAWWA

* * * * *

BILLINGS STARTING UP NEW UNITS

Billings has started operations in their activated sludge secondary treatment operations with the first wastewater addition to the aeration tank and secondary clarifiers on May 17.

According to John Voelker, General Superintendent, it is expected to take three to six weeks before wasting of activated

sludge will be started. At that time they expect to start up the heat treatment unit for treatment of sludge. Their new vacuum filter is in operation and the old filter is being moved to its new location in the new filter building.

#

A prisoner, about to be executed, was being blindfolded. The captain of the execution squad asked if he wanted a last cigarette.

"No, thank you," said the prisoner, "I'm trying to quit."

#

PROGRAM COMMITTEE SEEKS INPUT

The Joint MSAWWA/MWPCA Program Committee is already in action toward development of conference program for 1977. They are seeking ideas and suggestions from members of the AWWA section and MWPCA. Bob Sanks started things rolling with a list of proposed items for the next conference program and committee chairman Alf Hulteng has added more. Miles Tuttle, Art Clarkson and Ken Johnston have made contributions to this list. Now is the time for you to reflect upon subjects that you think would interest you, or those in your branch of this business of water and wastewater.

They need subjects of interest to both operations people and to technical/engineering members. They need ideas on management, public relations, general interest, and especially they are interested in subjects timely to the profession and to Montana.

What would you like to see programmed for the next conference in Bozeman? What is of special interest to you? Drop a note to Alf Hulteng, Box 20296, Billings, Montana 59103 and let him add your thoughts to the list.

* * * * *

TALK ABOUT A HOT SEAT!!

An unidentified nurse at Hopkins County Hospital was painfully but not seriously burned at 1:43 p.m. yesterday when she threw a match into a commode into which ether had been poured but not flushed down.

A hospital spokesman said today that leftover ether is often flushed down the commode as a means of disposing of this highly combustible liquid. This was apparently what happened yesterday, only the commode hadn't been flushed. The nurse, seated on the commode, reportedly struck a match to light a cigarette and then threw the match into the commode, causing the ether to ignite.

After receiving medical attention, the nurse was sent home for the rest of the day.

(from the DIGESTER/OVER THE SPILLWAY, published by the State of Illinois Environmental Protection Agency.)

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OPERATOR TRAINING AT BILLINGS

A special wastewater training class has been established at Billings to train new entry and upgrade of wastewater operators. The class is a joint effort by the City of Billings Public Works Department with the Employment Security Division and State Department of Health and Environmental Sciences and with the Environmental Protection Agency. The group consists of 11 people and includes three women.

The training program calls for a 12-week period of instruction leading through the basic background material of wastewater education and on into the elements of primary and secondary treatment. Following the basic instruction, a period of eight weeks will be taken for detailed on-the-job instruction and training on specific job assignments.

The program is being instructed by Paul O'Leary of Denver. Paul is an experienced wastewater treatment plant operator and is an independent training specialist working under contract to the EPA.

SAFE DRINKING WATER ACT HIGHLIGHTS

I. Safe Drinking Water (SDWA)(PL93-523)

- A. Enacted December 16, 1974
- B. Authorized EPA to establish national drinking water regulations.
- C. Intent is for states to assume primary responsibility for the water supply program.

II. Definitions

- A. Public water supply - a system for the provision to the public of piped water for human consumption, if such system has at least ten service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.
- B. Interim Primary Regulations
 1. Establishes maximum contaminant levels, monitoring frequencies and reporting requirements.
 2. Promulgated Dec. 24, 1975.
 3. Effective date: June 24, 1977.
- C. Community Water Supply - A public water system which serves at least 10 service connections used by year-round residents or regularly serves at least 25 year-round residents.
- D. Non-community water supply
 1. Any public water supply which is not a "community" supply.
 2. Examples: Recreation areas, roadside restaurants, motels, reststops, visitors centers, etc.

III. REQUIRED MONITORING*

	COMMUNITY	NON-COMMUNITY
<u>A. BACTERIOLOGICAL</u>		
1. Begin	June 1977	June 1979
2. Frequency	Population Table	State Option Minimum - 1 Per Quarter
<u>B. TURBIDITY (SURFACE SOURCES ONLY)</u>		
1. Begin	June 1977	June 1979
2. Frequency	Daily	Daily
<u>C. INORGANIC CHEMICALS</u>		
1. Baseline Sample By	June 1978	Nitrate by June 1979
2. Frequency	Surface - Yearly Ground - Triennial	State Option
<u>D. PESTICIDES</u>		
1. Baseline Sample By	Surface - June 1978 Ground - State Option	State Option
2. Frequency	Surface - Triennial Ground - State Option	State Option

*All analyses must be conducted in State approved laboratories.

IV. RECORD MAINTENANCE

- a) Microbiological not less than five years
- b) Chemical not less than 10 years
- c) Action taken to correct violations not less than three years
- d) Copies of reports, summaries, surveys and correspondence related thereto by system, consultant, or regulatory agency for not less than 10 years after completion of survey
- e) Concerning variances and exemptions not less than five years.

DRINKING WATER PARAMETERS
Bacteriological

<u>PARAMETER</u>	<u>MAXIMUM ALLOWABLE LEVEL, MG/L</u>	<u>METHOD OF ANALYSIS</u>
<u>Microbiological</u>		
Coliform Bacteria	<p><u>Membrane Filter</u> Coliforms shall not exceed: 1 per 100 ml, mean of all samples per month, 4 per 100 ml in more than one sample if less than 20 samples collected per month, or 4 per 100 ml in more than 5% of samples if 20 or more samples examined per month.</p>	Membrane Filter
	<p><u>Multiple Fermentation Tube - 10 ml portion</u> Coliforms shall not be present in more than 10% of portions per month, Not more than 1 sample may have 3 or more positive portions when less than 20 samples are examined per month, or Not more than 5% of samples may have 3 or more positive portions when 20 or more samples are examined per month.</p>	Multiple Fermentation Tube
	<p><u>Fermentation Tube - 100 ml portion</u> Coliforms shall not be present in more than 60% of the portions per month, Not more than 1 sample may have all 5 positive portions when less than 5 samples are examined per month, or Not more than 20% of samples may have all 5 positive portions when 5 or more samples are examined per month. If sampling rate is less than 4 per month, compliance shall be based on 3 month period unless state determines otherwise.</p>	Multiple Fermentation Tube

DRINKING WATER PARAMETERS
Chemical

<u>PARAMETER</u>	<u>MAXIMUM ALLOWABLE LEVEL, MG/L</u>	<u>METHOD OF ANALYSIS</u>
<u>Inorganic</u>		
Arsenic	0.05	Atomic Absorption
Barium	1.	Atomic Absorption
Cadmium	0.010	Atomic Absorption
Chromium	0.05	Atomic Absorption
Lead	0.05	Atomic Absorption
Mercury	0.002	Flameless Atomic Absorption
Selenium	0.01	Atomic Absorption
Silver	0.05	Atomic Absorption
Fluoride		Electrode
53.7°F & below	2.4	
53.8 - 58.3	2.2	
58.4 - 63.8	2.0	
63.9 - 70.6	1.8	
70.7 - 79.2	1.6	
79.3 - 90.5	1.4	
Nitrate (as N)	10.	Brucine Colorimetric
<u>Organic</u>		
Endrin	0.0002	EPA Methods
Lindane	0.004	EPA Methods
Methoxychlor	0.1	EPA Methods
Toxaphene	0.005	EPA Methods
2,4-D	0.1	EPA Methods
2,4,5-TP Silvex		

Turbidity

Turbidity at representative entry point to distribution system	1 TU monthly and 5 TU average of two consecutive days	Nephelometric
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Most cities and towns will have little or no trouble meeting the maximum allowable concentration except for those water supplies using surface water sources with no treatment other than chlorination. The regulations establish the turbidity limit at one turbidity unit and say that it may go to five units under certain conditions. These limits may be impossible to obtain during heavy runoff without filtration or additional treatment.

In some cases, auxiliary water sources such as wells may be used during periods of high turbidity. The use of surface water can be discontinued during this time.

It is not too early to plan as to how your city will meet the turbidity regulations. The construction of auxiliary water sources or improved water treatment facilities will take time. We urge that you give this matter immediate attention.

If the Department can be of any assistance in helping you plan for improvements to your water system, please feel free to contact our office.

CHLORDANE CONTAMINATION OF A MUNICIPAL WATER SYSTEM - TENNESSEE

At approximately 5:45 p.m. on March 24, 1976, several residents of Chattanooga noticed that their tap water had suddenly turned white and smelled of insecticide. By the following day it was established that a 3-street area was affected, and the water supply was promptly cut off by the water company. Samples of water taken on the evening of March 24 revealed chlordane as the contaminant in concentrations up to 1,200,000 parts per billion.

A house-to-house survey, conducted on March 26 and 27, reached 45 of the 49 affected households (92%). One hundred and twelve persons were questioned, and 17 (15%) gave a history of having drunk the suspect water, while another 15 (13%) had casual contact through washing, bathing, or brushing teeth. Blood samples for chlordane analyses were obtained from 71 persons who gave a history of water contact or who had symptoms possibly related to chlordane toxicity.

Four persons gave a history of probable chlordane toxicity, that is, gastrointestinal symptoms such as nausea, vomiting, abdominal pain, in addition to evidence of neurologic involvement such as dizziness, blurred vision, irritability, headache, paresthesias, muscle weakness, or twitching. Nine other persons had gastrointestinal symptoms alone or isolated neurologic symptoms. One of the suspect cases developed a fever of 102⁰F; she had recently recovered from an episode of intrahepatic cholestasis. None of the residents was hospitalized, and all affected persons improved within 36-48 hours after exposure.

Results of quantitative analyses for chlordane in water focused attention on a section of one affected street as the possible source of contamination. A strong smell of chlordane came from the foundation of a house there, and soil samples from around that house were found to contain chlordane in concentrations of greater than 1,000,000 parts per billion. Further questioning of the residents established that chlordane had been used at the

house on March 24 for extermination of termites. The concentrated chlordane solution had been diluted with tap water approximately 90 minutes before chlordane was detected downstream in the water system.

Blood analyses on the 13 individuals with symptoms revealed measurable levels of transnonachlor, a chlordane metabolite, in 11 (85%). The highest level, 1.27 parts per billion, was recorded in the one individual who also had the only detectable oxychlordane level (0.37 parts per billion). Results of blood tests on the remaining 58 exposed individuals are pending.

The water company has replaced all the street pipes and is in the process of flushing each house in an attempt to remove residual chlordane.

Editorial Note: This appears to be the first recorded incident of chlordane contamination of a public water supply in which symptoms of toxicity have been cited.

The exact mode of entry of the pesticide into the water supply is not clear. The most likely explanation is that back siphonage of chlordane occurred during the process of diluting the pesticide when the hose from the water faucet dipped below the level of the concentrated chlordane. Such an explanation is quite possible because several main pipes had been broken the preceding week by building contractors causing variable water pressure in the system.

The significance of the chlordane levels in this exposed population is difficult to assess. Oxychlordane and transnonachlor are recently discovered metabolites of chlordane, and review of the literature reveals no population studies of chlordane levels to date.

(from Morbidity and Mortality Weekly Report, U. S. Department of Health, Education and Welfare/Public Health Service).

WATER AND WASTEWATER OPERATORS'
EXAMINATION RESULTS

Carl Chopper, Billings, Chairman, and Don Willems, Helena, Director, Water and Waste Water Operators Certification Board, announced the certification of 22 persons as water and waste water treatment plant operators. Those passing the examination which was held in Butte are:

Class 1: Pat Smith and Gwendel DuVall, city of Billings; Roger Reich, HKM Consulting Engineers and Richard Krause, Great Western Sugar Company; Billings; Charles Fox, Columbia Falls; Glenn Kipp, Dillon; Jack Jimison and David George, city of Glasgow; Donald Watterud, Glasgow AFB, Hugh Wilkins and Louis Ball, Great Falls; Will Garvin, Helena; and Tom Sharpe of Livingston.

Class 2: John Armstrong and Bruce Thomas, Bigfork; John Spartz, Continental Oil Company, Billings; and James Lentz, Thompson Falls.

Class 3: Myron Littlebird, Ashland; Wayne Pearson, Absarokee; John Leatham, Neihart; Norman Beebe, Superior; and Roy Kemp, Big Mountain, Whitefish.

The next examination is scheduled for Friday, November 19, 1976 at Montana State University, Bozeman. Anyone interested in taking the examination should contact the Water and Waste Water Operators Board, Department of Health and Environmental Sciences, Helena.

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OPERATOR MEETINGS IN MILES CITY AND SIDNEY

One-day operator meetings were held in Miles City on April 28 and in Sidney on April 29. They were very well attended with 18 at the Red Rock Village in Miles City and 17 at the LaLond Hotel in Sidney. Art Clarkson discussed the Clean Water Act and Alf Hulteng commented on the happenings around the eastern part of the state and how to fill out self-monitoring reports. Ken Johnston demonstrated a videotape training program and presented a slide show on Montana lagoons and dis-

cussed the operations of lagoons in general. Judd Peterson of the Safety and Health Bureau of the Worker's Compensation Division explained the role they play in inspection and enforcement of MOSHA.

Attending at Miles City were Bud Jacobs, Frank Cory, Bob Leidholdt and Ernest Dent of Miles City; Ralph Hilderbrand and Joe Miller of the Miles City USDA-ARS. Tom Winchell and Charles Mohr came from Glendive; Nolan Fandrich, Bob Cope and Roger Sprague attended from Colstrip; Donald Boggs and Mayor Joe Barrow from Ekalaka; Pat Manyx from Forsyth; and Wilbert Kogele came from Broadus. Malcom Wilson and Carl Miller came from the Pine Hills School, and Ken Gasterich of Peabody Coal.

At Sidney, Harold Mercer, Ed Banta and Jim Irvin represented the city; Don Lind and Don Murdock came from Holly Sugar, and Emmett Gendron, well driller, Sidney. Red Hamman and Sonny Schriver came from Circle, Junior Germann from Plentywood; Clarence Bakken from Medicine Lake; Chuck Worley from Wolf Point; Maynard Collmer from Culbertson; Howard Smith and Mayor Jim Rowe from Poplar; Albert Anderson, a well driller from Medicine Lake; sanitarians John Geach of Glendive and Tim Altschwager from Wolf Point.

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BUTTE HOSTS JOINT AWWA/MWPCA CONFERENCE

The 51st annual meeting of the Montana Section of the American Water Works Association and the 32nd annual meeting of the Montana Water Pollution Control Association were jointly held at The War Bonnet Inn in Butte on March 25 and 26, 1976. Attendance was very good with 123 men and 59 women registered.

The meeting was called to order with an invocation by Sister Eileen Marie Johnson of Butte Central High, followed by welcoming remarks by Mayor Mario Micone and Silver Bow County Commissioner, Ed DeGeorge, and response by Ken Johnston, Vice-President of MWPCA. Following a brief business meeting in which joint committees reported on activities, a presentation was made on installation of flexible lining for sewage

collection systems by John Ryan of Phillips Products Company and the Design, Manufacturer and Installation of Clay Pipe by Don Lacy of the National Clay Pipe Institute.

A spring snow storm dampened the enthusiasm of most for the annual golf tourney, but a few hardy souls managed to complete the course.

An outstanding portion of the program was a panel discussion led by Rollin Adams "Non-Operational Plants, Where, and What Is the Problem". Bob Haverfield, Bill Pasco, Tom Thomas and Willis Wetstein generated an active discussion that was both enlightening and thought provoking.

Second-day programming included an address on Resource Recovery and Energy Conservation by Terry Carmody, Chief of the Solid Waste Management Bureau of the State Department of Health and Environmental Sciences, and address on Multiple Use Concept of Watersheds by Dr. Howard Peavey of Montana State University and Safety Programming by Marvin Johnson of Anaconda Company.

Hospitality rooms of equipment and chemical suppliers and representatives supplied evening convivial entertainment and an opportunity to renew friendships, both old and new.

Officers for the 1976-1977 year were elected: AWWA Section Chairman, Miles Tuttle; Chairman-Elect, Mike Thomas; Vice Chairman, Howard Smith; Trustees, Dick Nisbitt and Harold Paulsen. MWPCA President, Ken Johnston; President Elect, Alf Hulteng; Vice President, Bill Pasco, and Trustees, Bob Haverfield and Larry Larsen. Ralph Dunahoo was re-elected Executive Secretary of the Montana Section of AWWA, and Lou Garske was re-elected Executive Director of Montana Water Pollution Control Association.

The farmer was having a tough time getting his new mule through the barn door be-

cause his ears were too high to fit through the doorway. So he got a jack and started to jack up the barn when his cousin dropped by.

"What on earth are you doing?" the cousin asked.

"My mule won't fit the door," replied the farmer, "so I'm trying to raise the door so he will fit it."

"You darn fool," said the cousin, "why don't you just dig a hole at the door so the mule can walk through it?"

"Because," said the farmer indignantly, "It's his ears that are too long, not his legs."

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Mixed emotions is an Arab sheik with an expensive car that is beginning to burn oil.

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WATER SUPPLY SYSTEM RECORDS by A. W. Clarkson

Every year a number of public water departments incur the ill-will of their customers because of the fact that, through accident or negligence, property damage is caused by failure to shut off the water fast enough in times of an emergency.

It is highly important that a complete record of the public water system be kept. First, a map of the community should show the locations of all mains, hydrants, valves, cut offs and other appurtenances to the water system. Also, it is desirable to include on this map all sections of the system that have recently been constructed or replaced.

In addition to the map, the water utility should maintain a system of detailed records for each valve, that is, where it is located on the main and its exact location in the street. The most satisfactory

method to keep this record is in a book, allowing one page for each valve location. The books should be coordinated with the map, either by area, by streets, by improvement districts or in some way so that in the event of an emergency all employees could look at the wall map and find where the source of trouble is located and choose the proper book for that area before going out to cut off the water.

Each valve should be numbered and the corresponding number of the valve be shown on the particular page in the book in addition to the location of the water main in the street and the location of the valve on the main. One method of doing this is to orient the valve when it is installed to two permanent nearby points. The corners of permanent buildings are very good for measuring from. The valves should be located by at least two measurements so that it can be found at any time and under all weather conditions with a minimum of trouble. It is suggested that measurements be so made from the orientation points that the intersection of the two distances will cross immediately above the valve stem. Much time can be saved in digging if this method is employed.

It is also desirable to note on the page in the book the number of turns required to close each valve. This is especially advantageous in systems where the valves are not standard or where each valve has a different number of turns to open and close it.

The valves should be uncovered and operated at least once each year to ascertain if they function properly. At the same time the measurements from the orientation points to the valves should be checked to see if there has been any change in the distances. In some instances buildings may be moved, fire hydrants relocated and the supposedly permanent points destroyed. It is then necessary to reestablish the measuring points.

During the annual inspection the location of the valve box covers below the street level should also be checked and if

necessary raised to a distance nearer the top of the ground. It is often during the winter months when digging is extremely difficult that water mains break because of freezing. It is important to have the valves easily accessible, at all seasons of the year.

Should any community have questions concerning the establishment of adequate water system records they should contact the Water Department of one of the larger cities or the State Department of Health and Environmental Sciences. The personnel of these departments will be glad to assist a community in devising a complete set of records for their system.

